

**REVIEW OF THE  
INFORMATION SCIENCES DIVISION  
INTERNATIONAL DEVELOPMENT RESEARCH CENTRE**

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## INTRODUCTION

1. This review was prepared by two Governors of the Centre, the late Dr. Yelavarthy Nayudamma and Dr. Peter Larkin, at the request of the President and the Board. The review activities comprised: (1) a short briefing session on March 21, 1985, with Vice President Mullin and Division Director Stone; (2) consideration of a preliminary draft of a Divisional Review document together with some background reading materials prepared by the divisional staff; (3) discussions with the Director and Associate Directors and staff by Dr. Larkin on June 6-7, and by Dr. Nayudamma on June 18-19; and (4) discussions with the Directors of the other divisions of the Centre on June 19. It was decided not to engage an external specialist consultant. Although much of the work of the Division is highly technical, it was not apprehended that work of the staff was in need of technical appraisal. The matters to be addressed were related to policy or organization. Dr. Nayudamma reviewed an early draft of this report and the subsequent revisions were based largely on his suggestions.

## SOME BROAD PERSPECTIVES

2. It is commonly remarked that society is embarking on an age of information, an age in which there is ready access to whatever information is relevant to the business at hand. For those who wish to do a better job of whatever they do, more information is an added insurance of success. For those who aspire to add to the stockpile of knowledge -- those who do research -- nothing is more critical to success than knowing what is known. For those organizations such as IDRC that aspire to foster research, a major emphasis on the devices and techniques of information dissemination is essential, and from its inception IDRC has devoted a substantial proportion of its resources to the Information Sciences Division and its predecessors.

3. The initial activities of the Division were in large measure aimed at building within-Centre resources of facilities and personnel to service the information needs of the other divisions of the Centre and the community of Canadians with interests in development. Subsequently the Division undertook more outreach activities and the management of projects proposed by developing countries. The present configuration of the Division may thus be seen as relatively mature, equipped with the resources of people and things to enable the performance of both service and entrepreneurial roles. To the extent a balance in these roles can be maintained, the Division should continue to be successful.
4. Both roles must be undertaken with adequate awareness of an empathy for the activities of other divisions of IDRC. The service role is pervasive. Virtually all projects of the Centre have an information component. The Division must therefore have a particular dedication to the provision of information and expertise on information to the other divisions.
5. The entrepreneurial role, facilitating proposals for projects, is less straightforward. The capacities of developing countries for handling information are only peripherally improved by "patching" information science components on projects concerned with research on other subjects. To make substantial contributions, projects must be aimed at information systems per se. Between these extremes of "patch on" or "stand-alone" there is a middle ground that also may be exploited to considerable advantage. It is with this recognition that in varying degrees the five components of the Division are involved in parallel or collaborative activities with other divisions.
6. While service and entrepreneurship have been and will be the bread and butter of the Information Sciences Division, it should not be forgotten that the Division has and should continue to identify and attack problems of generic significance in the developing countries. MINISIS is an IDRC success story. What is the sequel?

7. It is also to be kept in mind that, as a relatively mature Division, it will be necessary to perform the necessary roles within the constraints of a more or less fixed budget and personnel establishment. Consolidation and the setting of priorities will be important facets of management.
8. With these kinds of considerations in mind -- service, entrepreneurship, imagination and priorities -- the following comments were prepared on the organization of the Division and the activities of its components.

#### BROAD FEATURES OF ORGANIZATION

9. Until 1984/85, the program was organized into four categories: (1) Information about Development; (2) Information for Development; (3) Infrastructure Development; and (4) Within-Centre Projects. This structure was not altogether in harmony with the organization of the other divisions of the Centre.
10. For 1985/86, a new organizational structure has been developed which is more consistent with that of other divisions. The Science and Technology Information, Socio-Economic Information and Information Tools and Methods programs have been structured in the project mode for executing the Division's mandate. As might be expected, there is a degree of parallelism between the projects of these programs and those of the other divisions of the Centre and this is seen to be desirable, provided it is not unduly constraining or conducive to a dilution of effectiveness.
11. The remaining two sections of the Division, which are to be given program status in 1985/86, are the Centre's Library and the Computing Systems Group. This small change in status will remove the anomaly that previously they were formally denoted as

activities supported by grants from the Centre. Again, this seems to be a sensible regularization of the organizational structure. However, the implication that these two groups might be involved in projects has not been sufficiently explored and there remains a considerable muddle about how these activities should be organized. The problem won't be solved overnight. Some suggestions for reorganization are supplied toward the end of this review.

12. Although it goes beyond the scope of this review, it is also to be noted that the organization of the Division should be seen in the context of the organization of the Centre as a whole. The three divisions grouped under the Vice President, Research Programs, are best described as subject-oriented (Agriculture, Food and Nutrition Sciences, Health Sciences and Social Sciences). The other two Vice Presidencies each comprise a mix of divisions with various degrees of emphasis on within-Centre service. Of these several divisions, Information Sciences perhaps epitomizes the more general question of how best to balance the entrepreneurial project activity with the service role in the Centre as a whole.
13. It is our conviction that the guiding philosophy should be that all projects are seen as Centre projects primarily and as divisional projects secondarily. It behooves all divisions generally, and the Information Sciences particularly, to participate as required in all of the Centre's activities. Bearing in mind that the perceptions of the developing countries are the guiding factors in project definition, it is essential that the organization of the Centre should not constrain the ability to respond effectively. It is our perception that this is the philosophy of the Division and we commend it.

## COMMENTS ON THE ACTIVITIES OF THE PROGRAMS

### Science and Technology Information Program

14. The objective of the program, which encompasses the natural sciences, is assistance in the establishment of services which meet the needs of developing regions as reflected by the research projects supported by the Centre. The activities of the program are: (1) the repackaging and dissemination of information in such a way as to engender multiplier effects; (2) the support of user needs in planning implementation and evaluation studies; (3) the support of applied research in special cases where the results may have a short term impact.
  
15. The emphasis until recently has been given to Agriculture with a close parallel to the activities of the Agriculture, Food and Nutrition Sciences Division. It is planned that these activities should continue to be the largest subprogram but the budget will be reshaped as some of what was formerly done as Agriculture is assigned to other subprograms (such as soil studies to earth/marine sciences). Latitude will also be created as many of the developing countries take over the responsibilities for the information centres that were established with IDRC support. An increasing emphasis on the agro-industry component of agricultural production systems is also seen as important. These plans seem highly appropriate and are strongly endorsed.
  
16. The Fisheries subprogram is evolving from an in-house information service to regional networks. Bearing in mind the importance of artisanal fisheries and aquaculture to rural communities, it is recommended that it is on these areas that the work of this subprogram continue to be focussed. The close relation to rural

agriculture should be kept in mind, particularly with respect to studies on the economics and sociology of the mixed farming and fishing pattern of subsistence.

17. A more recent emphasis on the Industry and Technology Information subprogram is responsive to the requests from developing countries to share in contemporary advances in the industrialized world. Because of the wide range of subject matter and the ongoing dilemma about whether small or large is beautiful, the subprogram has yet to focus its attention on other than the establishment of regional networks. It might be useful to consider hiring a consultant to suggest some appropriate lines for IDRC to pursue.
18. Energy information is a subactivity of the industry and technology program which has had a difficult gestation since its conception in 1981 and which will be weaned from special governmental funding in 1987/88. Two studies sponsored by the Division suggested focussing on small scale energy systems and dissemination of research results with practical applications. The projection of needs in this subject area suggests it should have a high priority and it has the advantage of being a piece of the energy spectrum which IDRC might be able to afford.
19. Earth/Marine Sciences is largely concerned with the geography and natural resources of developing countries and because the technologies involved are costly, IDRC concentrates on feasibility studies, stimulation of regional networks and, on a limited basis, establishing specialized information analysis centres in selected fields. Because of Canadian expertise in such subjects, cooperative projects may be common in this subject area.

20. Given the many demands on this program as a whole, it is recommended that there be clearly delineated priorities, that reflect the most immediate and short term needs, giving first attention to industry and technology other than energy, second to agriculture, fisheries, forestry and energy, and third to earth and marine sciences.
  
21. Highest priority is recommended for industry and technology because it is in this area where the gap between developed and developing countries is expanding most rapidly. The knowledge explosion in science and engineering applied to industry has major economic consequences for the developing countries unless they can catch up. Agriculture, fisheries and forestry, and energy are fields in which much effort has been given but much still remains to be done, especially in helping the upcoming generation of young researchers in the developing countries. In these fields, the Centre has an opportunity to build on the gains that have been made. The earth and marine sciences are certainly relevant for natural resource development and should be supported but these are areas in which building research competence in developing countries is likely going to take a long time. The best approach seems to be a steady investment at a relatively modest level.
  
22. The problem involved in ensuring the flow of proprietary industrial information, not only from the developed to the developing countries but among the developing countries, should be given particular attention. This is not a new problem, but with the increasingly accelerated pace of technological change, especially in the applications of microelectronics, computers and biotechnology, it is to be expected that the spread in development will rapidly widen unless steps are taken to counter the trend.



### Socio-Economic Information Program

23. The Socio-Economic Information Program covers a very wide ranging set of interests that in substantial measure is set up in parallel with the activities of the Social Sciences Division and the Health Sciences Division. Leaving aside the activities related to infrastructure development, there are no less than 24 "program thrusts" grouped broadly under two subprogram headings (Social and Economic Systems; and Human Environment, Health and Population) and six subheadings. Twelve of these "program thrusts" have been identified as new in the 1985/86 program of work.
24. This is far too diffuse a program in the circumstances of a fixed budget, especially in the social sciences for which there is commonly need for a relatively large measure of project management. It is strongly recommended that the program focus its work on no more than one half the number of program thrusts identified. An emphasis on Social, Legal and Cultural Issues and the Human Environment groupings might well be most appropriate in the next five years.
25. An emphasis on these two areas is suggested. These two areas are recommended for emphasis on the basis of needs and the areas in which other agencies are active. While one cannot dispute the need for development planning and development economics, the social, legal and cultural issues are not as well supported and may not be well supported in the future. Similarly, health and population issues have been addressed by many agencies, but the human environment issues, which underlies many health and population problems, are less well developed. Building the mind set on prevention rather than cure could be a valuable contribution to the developing countries.

26. The Infrastructure Development subprogram is concerned with Libraries and Archives and Records Management, National and Regional Systems, and Curriculum Development (for libraries and information specialists). These are topics of obvious interest to the professional staff in the Library and Computing Systems groups and, in some measure, in the Information Tools and Methods Program. This topic is addressed in more detail below. Suffice to say at this point that the present organization is not entirely satisfactory.
27. The Socio-Economic Information Program is also rather heavily weighted to projects in the Latin American region (in 1984/85, 14 of 26 projects; \$2.3 of \$3.7 million), and efforts should be made to achieve a better geographic balance.

### Centre Library

28. The Centre Library is an essential resource of materials about Third World development and provides strong support to the staff of the Centre in Ottawa, to the regional offices, and to the projects in developing countries. This is the highest priority activity for the Library and it should not be compromised. A second priority is service to the Canadian community concerned with Third World development, which is justified in the mandate of the Centre as enlisting the interest of Canadian scholars in problems of the developing countries. It is a dubious proposition that a library is the best device for enlisting such interest. What makes it even more dubious is that roughly a third of the library use by Canadian universities comes from the two universities in Ottawa. Moreover, the Library staff devote a significant proportion of their time to providing reference services to students of these institutions. As worthy a cause as this may be, it should be seen as directly competitive with the first priority activities and de-emphasized accordingly. The Library should not take it as its mission to bear the burden of enlisting the interest of the Canadian community.

29. Except for this question of priorities, the Library is seen as a first class professional operation which should not only continue to serve an essential role, but should be encouraged to become more directly involved in projects in which their professional skills and experience can be used to effect.
30. The notion of using the Library as a test-bed for bibliographic developments should be downplayed. It is certainly desirable that IDRC in general, and the Information Sciences Division in particular, should address problems that may have generic significance to developing countries. Whether the Centre Library is the best place to test bibliographic developments is less certain. The best argument in favor is that Centre staff would have immediate personal experience of the problems that might be encountered when the new technique was being applied elsewhere. Aside from the technology push aspects of this argument, there is the question of whether it isn't less expensive to test-bed by contracting out and the further question of the extent to which it is wise to have long term commitments tied to in-house research and development capabilities. It is recommended that test-bed activities be given low priority.
31. From time to time the Library has been involved in training activities and the preparation of manuals. More emphasis should be given to these possibilities because the professional capabilities of the staff are considerable.
32. Looking to the longer term, it must be anticipated that a "Doomsday" will come when there is no longer any room in the Library. There are many schools of thought about how such portents may be defused, but IDRC has the opportunity to go the route of decentralizing Library resources into the regional offices, maintaining communications electronically. That kind of solution should be adequate for more years than it is practical to foresee

technology and is strongly encouraged. The Centre should not plan on a greatly expanded space requirement for the Library in the new quarters to be built in Ottawa.

### Information Tools and Methods Program

33. Information Tools and Methods is a fledgling program that has come out of some of the erstwhile in-house activities of the Centre in response to the needs of developing countries for more sophisticated information services to research. To date, the emphasis has been on Computer Technologies and it is proposed to continue in that vein with most attention going to software and the application of computer technologies. The stress on application will also apply to the other subprograms, Telecommunications Technologies, Cartographic and Remote Sensing Technologies, and Other Information Technologies.

34. The contemporary world-wide information revolution makes the work of this program particularly critical to the future of IDRC, for access to information is key to research. To the extent that resources allow, the activities of this program should be vigorously expanded. A substantial investment in packet-switching technologies is a particularly attractive prospect. The launching of an asynchronous satellite which could act as a "travelling postman" for delivery of research-related information to developing countries is an exciting possibility that IDRC should continue to promote as a major Canadian World service project.

### Computer Systems Group

35. The Computer Systems Group has been almost exclusively devoted to the development and distribution of MINISIS and servicing of MINISIS installations, an activity in which it has had outstanding

success. Because new computing hardware and software systems for Library management are being developed at a steady pace, it seems likely that MINISIS has no more than another decade before it is replaced. The obvious question is whether IDRC should: (1) begin work on a successor system; (2) carry on with the distribution and servicing of MINISIS installations until it becomes defunct; (3) do both (1) and (2); or, (4) transfer the MINISIS responsibility and get out of the business of developing Library management software.

36. The present policy is a variant of (3), combining a carrying-on of past patterns of activity with efforts to develop a "MICRISIS" version of microcomputers.
37. The genesis of this enterprise has been essentially one of in-house applied research and development. Servicing is now likely to be done as well or better elsewhere, and it is recommended that various options should be explored for transferring responsibility for MINISIS. Establishing national or regional resource centres to provide MINISIS support services is the route preferred by the staff of the program. This is endorsed by this review with the caveat that within five years the national and regional centres be independent of IDRC support and the MINISIS support services from Ottawa be phased down to a minimal level.
38. We gave considerable thought to whether the Computer Systems Group should have an expanded service role within the Centre, giving advice on computer purchases and writing software packages as requested by various divisions on behalf of their project clients. This would probably have been a good idea 10 or 15 years ago. Today, computers and the arts of software development are as familiar to the younger generation as calculators and electric typewriters were to their parents. Computers are no longer something special. As a matter of course, all divisions should be

computer conscious and adequately informed about what is the most appropriate equipment and software for the activities in which their projects are engaged. We therefore see no wider service role for the Computer Systems Group, other than that which can be served casually.

### Some Suggestions for Reorganization

39. As has been intimated in the foregoing, there are some anomalies in the present organization which derive in large part from the way in which IDRC has grown. For example, it is hard to understand why the Computer Systems Group is not part of the Information Tools and Methods Program, which is strongly oriented to computer technologies. It is perhaps premature to make the move now because MINISIS must still be attended and consideration given to its translation (if that is the word) into different languages. But as others take over the responsibilities for MINISIS and its successors, the Computer Systems Group should address its considerable talents to new challenges in the Information Tools and Methods Program. Our advice is perhaps best summarized by remarking, "Let it happen."
40. It is also odd that library and archive-type projects should be undertaken in the Infrastructure Development subprogram of the Socio-Economic Information Program. These activities should be part and parcel of the Centre Library operation and should involve the Library staff.
41. By a similar logic, the Communications Division would be a part of the Information Sciences Division, or failing that, of the same Vice Presidency. The difficulty with such an arrangement would be the possible preoccupation of the Division (or Vice Presidency) with the mechanics of producing publications (and other kinds of communications) which call for somewhat alien technical expertise.

42. The pragmatic arrangement is probably to put the Communications Division with the administratively-oriented Vice Presidency, but to provide that any project activities of the Communications Division should be either sponsored by Communications but managed by the Information Sciences Division, or sponsored by Information Sciences and the management delegated to Communications. Regardless of how it is done administratively, both divisions should be involved.

### **Some Additional Observations**

43. In the course of the review, various matters came to our attention which seemed to warrant comment. Without going into the details of examples, it was apparent that the impact of the divisions' work could be considerably multiplied if the mechanisms of articulation with CIDA were strengthened. The provision of equipment to developing countries is a good example. While it is within the mandate of IDRC to provide equipment, it may not be within its means.
44. More generally, it should be a policy of the Canadian government that the implementation of the results of applied research sponsored by IDRC should be given high priority in the disbursements of CIDA. It is not just that applied research should have a sequel in application, but that Canada should clearly signal to developing countries that this is our belief. While it is flattering when United Nations agencies or the World Bank pick up an IDRC initiative, it is embarrassing when CIDA does not show the same enthusiasm.
45. It was noted that there has been a shift in emphasis in the activities of the Division from international and multilateral to national and bilateral. The pragmatic reasons for this shift are

appreciated, reluctantly. The implications, particularly in the relation among the various divisions of the Centre, could be the basis for some internal discussion to ensure coordination at the project level. The potential for joint projects should not be overlooked; indeed, it should be encouraged. Orchestration of projects could be a very desirable characteristic of the work of the Centre.

46. Another matter that may be of general concern is the tone of our discussions concerning priorities attached to various aspects of the work of the Division. Not infrequently, it seems that priorities are set more on the basis of the perceptions of the staff (and the Governors) than on the documented perceptions of the developing countries. It may well be that the regional offices and the extensive travelling of the program officers are an adequate set of antennae for day-to-day perception of the priorities of the developing countries. But we sense that this hypothesis could well bear some testing and evaluation, especially in relation to the differing entry levels for the various stages of development and the different scales and quantities of information needed. Perhaps the several networks could be challenged to address questions of priorities or, more generally, perhaps the Centre could address the question using any one of the several mechanisms by which advice may be solicited. There is a danger, of course, in casting the net so widely that only sweeping generalities ensue, but for the Information Sciences Division in particular, an exercise of this kind would seem to be a good investment in long term planning.
47. In a related vein, it is useful to ask if the Division is satisfied that its efforts in the past have had the desired impact, for it is not only the subject of a project which is important, but also whether the execution was effective, and whether the desired impact was achieved. Difficult as it may be to assess the somewhat invisible commodity called information, it should be incumbent upon



the Division to have each project evaluated both internally and by the project team. The implications of this sort of practice as a routine would sharpen the answers to such questions as "Why is the Division's budget set as a proportion of the budget of the Centre?". To turn a phrase, the method of the Division's madness should be articulated.

48. We conclude by thanking the Vice President, the Division Director and all of the staff, both for their cooperation and for their restraint in directing our reflections.